

WHAT IS CLAIMED IS:

1. Handle for hand and garden tools which causes a preferred coupling position of an assigned group of hands when the respective tool is used, with a first section (42, 162) that is essentially intended for contacting the palm (33), and with a second section (43, 163) that is essentially intended for being encompassed by the finger joints, wherein the two sections (42, 162; 43, 163) respectively lie on one side of an imaginary longitudinal axis (39, 164), wherein the first section (42, 162) contains a distal part (50, 168) that is intended for being encompassed by the thumb bridge (26) between the thumb (20) and the index finger and assigned to a handle beginning, a proximal part (54, 170) that is intended for contacting the ball of the hand root (29) and assigned to a handle end, and a center part (52, 169) that lies between the distal part and the proximal part (50, 168; 54, 170), wherein said center part has a pronounced radially outward directed curvature (57, 171) that extends over at least part of its circumference and is intended for snugly adjoining the palm (33), and wherein said curvature has a surface, the distance of which from the longitudinal axis (39, 164) is at its greatest in a maximum (59, 178) that is situated in a central region of the curvature (57, 171) and distinctly decreases from this maximum to the distal and proximal parts (50, 168; 54, 170), characterized by the fact that a length (L0.1) of the center part (52, 169) amounts to between 45% and 55% of the hand width (B) of the assigned group of hands (19), and by the fact that the curvature (57, 171) has — if viewed in a longitudinal section that contains the longitudinal axis (39, 164) — a curvature radius (R2.1) of 60-120 mm in the maximum (59, 178).
2. Handle according to Claim 1, characterized by the fact that the first section (42, 162) lies above an imaginary central plane (yz-plane) that includes the longitudinal axis (39, 164), with the second section (43, 163) lying below this imaginary central plane.
3. Handle according to Claim 2, characterized by the fact that the maximum (59, 178) lies in a plane (xz-plane) that extends perpendicular to the central plane and includes the longitudinal axis (59, 164).
4. Handle according to Claim 2, characterized by the fact that the maximum (point 137) lies in a plane that is arranged perpendicular to the central plane (xz-plane) and spaced apart from the longitudinal axis.

5. Handle according to one of Claims 1-4, characterized by the fact that the surface of the curvature (57, 171) contains a generatrix that extends from the distal to the proximal part (50, 168; 54, 170), with said generatrix representing the geometric location of all points that have the greatest distance from the longitudinal axis (39, 164) in the center part (52, 169) in all cross sections (B—B) along the longitudinal axis.

6. Handle according to Claim 5, characterized by the fact that the generatrix is a plane curve.

7. Handle according to Claim 5, characterized by the fact that the generatrix is a three-dimensional curve (155, 156).

8. Handle according to Claim 7, characterized by the fact that the points (133-143) of the three-dimensional curve (155, 156) partially lie on one side of a plane that extends perpendicular to the central plane (xz-plane) and includes the longitudinal axis, with part of the aforementioned points lying on the other side of said plane.

9. Handle according to one of Claims 1-8, characterized by the fact that all generatrices of the surface of the curvature (57, 171) have a convex progression.

10. Handle according to one of Claims 1-9, characterized by the fact that the proximal part has a surface contour that continuously decreases from the center part to the proximal end.

11. Handle according to one of Claims 1-9, characterized by the fact that the proximal part (54, 170) has a continuously concave surface contour from the center part (52, 169) to the proximal end.

12. Handle according to Claim 10 or 11, characterized by the fact that a length LIII.1 which is measured between the maximum (59, 178) and a proximal end (46) amounts to 50-55% of the hand width (B) of the assigned group of hands.

13. Handle according to Claim 10 or 11, characterized by the fact that a length LII.1 which is measured between the maximum (59, 178) and the minimum (61, 180) or a central region of the proximal part (54, 170), respectively, approximately amounts to 33-37% of the hand width (B) of the assigned group of hands.

14. Handle according to one of Claims 1-13, characterized by the fact that the distal part (50, 168) has a continuously concave surface structure from the center part (52, 169) to the distal end.

15. Handle according to one of Claims 1-14, characterized by the fact that the center part (52, 169) has — if viewed in the form of longitudinal sections — gradually decreasing curvature radii (R2.3, R2.4) on both sides of an imaginary plane that extends through the maximum (59, 178) and includes the longitudinal axis (39, 164).

16. Handle according to one of Claims 1-15, characterized by the fact that at least one of the lengths (L0.1, L1.1, LII.1 and/or LIII.1) is realized in accordance with one of the tables shown in Figures 93a-96c.

17. Handle according to one of Claims 1-16, characterized by the fact that at least one additional dimension (LI.2 -LIII.4, A1A-A3D, R1.1-R3.4, R1.10-R3.13) is realized in accordance with one of the tables shown in Figures 93a-96c.

18. Handle according to one of Claims 1-17, characterized by the fact that it essentially has a continuously egg-shaped, oval or elliptical cross sections in the longitudinal direction.

19. Handle according to one of Claims 1-18, characterized by the fact that the handle is realized in one piece, and by the fact that the first section (42) is integrally connected to the second section (43) by an inner section (44)

20. Handle according to one of Claims 1-18, characterized by the fact that the handle consists of two pieces, wherein the first section and the second section (162, 163)

respectively form part of a separate handle part, and wherein the two handle parts are separated by an intermediate space.

21. Handle according to Claim 20 for pliers, characterized by the fact that the curvature is realized such that its maximum lies closer to the proximal part than to the distal part.

22. Handle according to Claim 20 or 21, characterized by the fact that the first section (162) and the second section (163) are essentially realized identically and in a laterally reversed symmetric fashion referred to a central plane (yz-plane).

23. Handle according to one of Claims 20-22, characterized by the fact that it has continuously elliptical, oval or egg-shaped cross sections if imaginary surfaces along the longitudinal axis (164) which connect lateral regions of the sections (162, 163) are included.

24. Handle according to one of Claims 1-23, characterized by the fact that it is assigned to a group of small hands and its dimensions are at least partially realized in accordance with one of the tables shown in Figures 93a-96c.

25. Handle according to one of Claims 1-23, characterized by the fact that it is assigned to a group of large hands and its dimensions are at least partially realized in accordance with one of the tables shown in Figures 93a-96c.

26. Handle according to one of Claims 1-25, characterized by the fact that it is assigned to a group of medium hands and its dimensions at least partially have values that lie between those for the groups according to Claims 24 and 25.

27. Handle according to one of Claims 1-26, characterized by the fact that the curvature (57, 171) extends in at least two directions that lie perpendicular to one another and is essentially defined with respect to its three-dimensional shape and size by a combination of the surface contour with the radius R2.1 which extends in an xz-plane at least over the length (L0.1) in the upper section (42, 162) of the center part (52, 169), the surface contour with the radius R2.3 and/or R2.4 which extends in a yz-plane, the radii 2.10

and R2.13 and/or R2.14 which define the cross-sectional contour in the maximum (59, 178) of the center part (52, 169) and the eccentricities AII.1 and AII.3 and/or AII.1 and AII.4.

28. Handle according to Claims 1-19, characterized by the fact that it has, in the region of the center part (52, 169), the curvature radii R2.2 and R2.5 of 60-150 mm, respectively in a plane 2 of 90° relative to the plane with the curvature radius R2.1 and in a plane 5 of 45° relative to the plane with the curvature radius R2.1.

29. Handle according to one of Claims 1-28, characterized by the fact that it contains a thumb support on the upper side of the distal region, wherein said thumb support is realized in the form of a trough or flattening (83, 87) that extends parallel or slightly oblique referred to the yz-plane and/or a lateral trough or flattening (101) that extends slightly oblique referred to the xz-plane.

30. Handle according to one of Claims 1-29, characterized by the fact that, in two-part handles, the region of the lower section (185) which is intended for supporting the fingers is largely realized cylindrically and only has a slight curvature in the direction of the longitudinal axis, wherein the upper section (184) has the pronounced concave-convex-concave curvature that extends in the direction of the xz-plane and in the direction of the yz-plane.

31. Handle according to one of Claims 1-30, characterized by the fact that a handle for left-handed users is realized in a laterally reversed fashion referred to a handle for right-handed users.

32. Handle according to one of Claims 1-31, characterized by the fact that its cross-sectional surfaces are defined by radii RA.10-RC.14, wherein the radii R.10 and R.12 lie between 12 mm and 30 mm, and wherein the radii R.11 and R.13 lie between 15 mm and 30 mm.

33. Handle according to one of Claims 1-32, characterized by the fact that the handle has an asymmetric shape for right-handed users and for left-handed users.

34. Handle set for a hand and garden tool which causes a preferred coupling position of the hand when the tool is used, characterized by the fact that the set contains a preselected number of handles (38, 78, 86, 106, 160) according to one or more of Claims 1-32, wherein the shape and/or size of each handle (38, 78, 86, 106, 160) predetermines the preferred coupling positions of the hands of a different group of hand sizes and/or hand shapes.

35. Handle set according to Claim 34, characterized by the fact that it contains at least two handles with different sizes.

36. Hand or garden tool with a functional part and a handle, characterized by the fact that the handle (38, 78, 86, 106, 160) is realized in accordance with at least one of Claims 1-33.

37. Hand or garden tool set, characterized by the fact that it contains a series of hand or garden tools with one and the same functional part (64, 105, 108), but different handles (38, 78, 86, 106, 160), wherein the shape and/or size of each handle (38, 78, 86, 106, 160) predetermines a preferred coupling position of the hands of a different group of hands.

38. Hand or garden tool set according to Claim 37, characterized by the fact that at least two handles (38, 78, 86, 106, 160) with different sizes are provided for each functional part (64, 105, 108).